

# EXHIBIT A

# CURRICULUM VITAE

**NAME:** Wolff M. Kirsch, M.D.

**TITLE:** Professor of Neurological Surgery, Loma Linda University  
Professor of Biochemistry, Loma Linda University  
Director, Neurosurgery Center for Research, Training and Education, Loma Linda University

**BORN:** March 2, 1931 in St. Louis, Missouri

**MARITAL STATUS:** Married, four children

**EDUCATION:** B.A., Washington University, 1951, Magna Cum Laude  
M.D., Washington University School of Medicine, 1955, Cum Laude

**MILITARY:** Captain, U.S. Army Medical Corps, Neurological Service, Second General Hospital, Landstuhl, Germany  
July 1957 - June 1959

## CLINICAL APPOINTMENTS AND FELLOWSHIPS:

Jackson Johnson Research Fellow in Biochemistry  
Washington University School of Medicine  
June - September 1952

Jackson Johnson Research Fellow in Clinical Pathology  
Washington University School of Medicine  
June - September 1953

Jackson Johnson Research Scholar in Clinical Pathology  
Oxford University  
August 1954 - January 1955

Intern in Medicine  
North Carolina Memorial Hospital, University of North Carolina  
July 1955 - June 1956

Fellow in Neurologic Medicine  
North Carolina Memorial Hospital University of North Carolina  
July 1956 - June 1957

Assistant Resident in General Surgery  
Barnes Hospital, Washington University  
July 1959 - June 1960

Fellow in Neuroanatomy  
Washington University School of Medicine  
July - December 1960

Assistant Resident in Neurosurgery  
Barnes Hospital, Washington University  
January 1961 - December 1962

Research Fellow in Neuropharmacology  
Washington University School of Medicine  
January - December 1963, January - July 1965

Chief Resident and Instructor in Neurosurgery  
Washington University School of Medicine  
January - December 1964

Assistant Professor, Division of Neurosurgery, Department of Surgery  
University of Colorado Medical Center  
July 1965 - June 1968

Associate Professor, Division of Neurosurgery, Department of Surgery  
University of Colorado Medical Center  
July 1968 - December 1973

Attending in Neurosurgery  
Veterans Administration Hospital, Denver, Colorado  
July 1965 - June 1982

Consultant in Neurosurgery  
Fitzsimmons Army Medical Center, Aurora, Colorado  
March 1969 - September 1971

Associate Professor and Head, Division of Neurosurgery  
University of Colorado Medical Center, Denver, Colorado  
July 1, 1968 - January 1, 1974

Professor and Chairman, Department of Neurosurgery  
University of Colorado Medical Center, Denver, Colorado  
January 1, 1974 - October 21, 1976

Program Director, Neurosurgery Training Program  
University of Colorado Medical Center, Denver, Colorado  
September 1969 - October 1980

Professor, Division of Neurosurgery  
University of Colorado Medical Center, Denver, Colorado  
January 1974 - June 1982

Chairman, Department of Neurosurgery  
Hadassah University Hospital, Jerusalem, Israel (sabbatical leave)  
October 1, 1980 - September 30, 1981

Professor and Chief, Division of Neurosurgery  
University of New Mexico School of Medicine, Albuquerque, New Mexico  
June 1982 - June 1989.

Professor and Director of Neurosurgical Research, Section of Neurosurgery  
Loma Linda University School of Medicine, and Jerry L. Pettis VA Medical Center, Loma Linda, CA  
July 1989 - 1998.

Chief, Neurosurgical Service  
Jerry L. Pettis Medical Center, Loma Linda, CA  
March 21, 1991 - 1998.

Chief and Program Director, Section of Neurosurgery  
Loma Linda University Medical Center  
July 1995 – December 31, 1998

Professor of Biochemistry  
Loma Linda University Medical Center  
January 1992 - present

Director, Neurosurgical Center for Research, Training and Education  
Loma Linda University  
January 1, 1999 - present

**LICENSURE AND CERTIFICATION:**

National Board of Medical Examiners, July 2, 1956  
American Board of Neurological Surgery, October 10, 1967  
Medical License (Missouri), July 1955, License #26148  
Medical License (North Carolina), August 1956, License #10673  
Medical License (Colorado), January 11, 1966, License #15203  
Medical License (New Mexico), November 15, 1982, License #82-229  
Medical License (California), December 11, 1989, License #G 067675

**NATIONAL COMMITTEES, BOARDS:**

Member, Review Study Section, Reparative Medicine. Bioengineering Research Grant Study Section, Center for Scientific Review, NIH, February 2003  
Associate Examiner, American Board of Neurological Surgery, Fall 1973, Fall 1996  
Ad Hoc Member, Cancer Research Review Committee, NIH  
Ad Hoc Review Molecular Biology Section, NSF  
Ad Hoc Review Grant Applications, NINDS  
Program Committee, American Association of Neurological Surgeons, 1973-1975  
Program Committee, International Meeting of Neurosurgery  
Referee for Journal *Science*  
Councillor, International Society For Experimental Microsurgery  
Chairman, Program Committee, American Association of Neurological Surgeons, 1975  
Member, Cancer Control Study Section (1975-1978) National Cancer Institute, NIH  
Active Member of the American College of Surgeons Colorado Committee on Trauma  
Member, National Board of Medical Examiners, Multidisciplinary Task Force for the Nervous System  
Neurology Section, National Board of Medical Examiners, Philadelphia, 1989-1990.

**SOCIETIES AND HONORS:**

Phi Beta Kappa  
Sigma Xi  
Alpha Omega Alpha  
Omicron Delta Kappa

Delta Sigma Rho (National Forensic Honorary Society)  
 American Academy of Neurology  
 Research Society of Neurological Surgeons  
 Jackson Johnson Scholar, Washington University School of Medicine  
 First Prize, St. Louis Surgical Society Scientific Forum, 1961  
 Association of Academic Surgeons  
 Denver Academy of Surgery  
 Executive Committee, Denver Chapter, American Cancer Society  
 Lifetime Active Member, American Association of Neurological Surgery  
 International Society of Neurochemistry  
 Neurosurgical Society of America  
 American College of Surgeons, Fellow  
 Pan-Pacific Surgical Society  
 Society of University Surgeons  
 Consulting Editor, Science Magazine  
 Senior Society of Neurological Surgeons (Society of Neurological Surgeons)  
 California Medical Association  
 Central Neuropsychiatric Association  
 Resident Sponsored Research for 1971, The Menninger Award  
 American Academy of Neurological Surgery  
 Resident Sponsored Research for 1971, First Prize  
 Society for Research in Hydrocephalus and Spina Bifida (The Welsh National School of Medicine)  
 Western Neurosurgical Society  
 Resident Sponsored Research for 1972, First Prize, American Academy of Neurologic Surgery  
 Resident Sponsored Research for 1973, First Prize  
 Okayama University School of Medicine  
 Okayama, Japan, Fall 1973, Silver Medal  
 Editor, Neurological Research: An Interdisciplinary International Journal  
 Member, External Scientific Review Committee, Johns Hopkins Hospital Oncology Center  
 International Society for Experimental Microsurgery  
 San Bernardino County Medical Society  
 VA Director's Front Line Award, 1991  
 The Society for Minimally Invasive Therapy  
 Merit Award for Video Production, Sponsored Research of Dr. Dennis Gaskill, The American Fertility Society, 1992  
 Recognition Award for Special Contribution to the University of New Mexico Health Center, 1996.  
 American Association for the Advancement of Science  
 California Association of Neurological Surgeons  
 Los Angeles Surgical Society  
 Coleman Visiting Professor of Neurological Surgery, Medical College of Virginia Hospital  
 Gold medal and Honorary Fellow, International College of Surgeons, October 2000  
 Treasurer, International Society for Experimental Microsurgery

#### **PATENTS:**

Denver Shunt, U.S. Patent No. 3,654,932  
 Surgical Microclip, U.S. Patent No. 4,586,503  
 Surgical Microclip, Britain Patent No. 2,150,440B

Surgical Microclip, Canada Patent No. 1,251,113  
 Surgical Microclip, France Patent No. 84 18256  
 Surgical Microclip, Germany Patent No. 34 43 367  
 Surgical Microclip, Italy Patent No. 1,181,465  
 Surgical Microclip, Sweden Patent No. 454,321  
 Applicator of Surgical Microclip, U.S. Patent Application No. 556,918  
 Surgical Clip, Applier and Method, U.S. Patent No. 4,733,664  
 Surgical Clip, Applier and Method, U.S. (Div) Patent No. 4,929,240  
 Surgical Clip, Applier and Method, Australia Patent No. 593581  
 Surgical Clip, Applier and Method, Brazil Serial No. PI86 05015  
 Surgical Clip, Applier and Method, Britain Patent No. 2,181,356  
 Surgical Clip, Applier and Method, Canada Patent No. 1,280,329  
 Surgical Clip, Applier and Method, France Patent No. 86,14243  
 Surgical Clip, Applier and Method, Germany Serial No. P3633124.4  
 Surgical Clip, Applier and Method, India Patent No. 165,360  
 Surgical Clip, Applier and Method, Italy Patent No. 1,218,121  
 Surgical Clip, Applier and Method, Japan Serial No. 61-243339  
 Surgical Clip, Applier and Method, South Africa Patent No. 86/7462  
 Surgical Clip, Applier and Method, Sweden Serial No. 86 04346-0  
 Surgical Clip, Applier and Method, Sweden (Div) Serial No. 90 00183-5  
 Method of Blocking Bioprosthetic Implant of Tissue Calcification *In Vivo*, U.S. Patent Application Pending 837165  
 Everting Forceps, U.S. Patent No. 4,950,281  
 Everting Forceps, China Serial No. 90101229.7  
 Everting Forceps, Patent Applications in Austria, Belgium, Switzerland, Liechtenstein, Germany, France, United Kingdom, Italy, Luxembourg, Netherlands, Sweden, and Japan  
 Aminomalonic Acid Antibodies, Antigens and Clinical Utility, U.S. Patent No. 322,640  
 System for Applying a Deformable Plastic Clip, U.S. Patent No. 4,983,176  
 System for Applying a Deformable Plastic Clip, China Serial No. 90101229.7  
 System for Applying a Deformable Plastic Clip, Patent Applications in Austria, Belgium, Germany, France, United Kingdom, Italy, Luxembourg, Netherlands, Sweden, and Japan  
 Multipurpose Surgical Tool, U.S. Patent No. 5,089007  
 Multipurpose Surgical Tool, Patent Applications in Austria, Belgium, Canada, Switzerland, Liechtenstein, Germany, France, United Kingdom, Italy, Luxembourg, Netherlands, Sweden, and Japan  
 Nerve Anastomosis Sling and Method, U.S. Patent No. 6,102,921  
 Endoscopic Triceps, Method and Apparatus, U.S. Patent Application Pending  
 Minimal Invasive CSF Shunt, U.S. Serial No. 07/874,293  
 Inflatable Endoscopic Retractor with Multiple Rib-Reinforced Projections, U.S. Patent No. 5588951  
 Membrane Endoscopic Retractor, U.S. Serial No. 07/874,536  
 Bladed Endoscopic Retractor, U.S. Serial No. 07/880,757  
 Laparoscopic Operating Microscope, U.S. Patent Application Pending  
 Trocar for Endoscopic Surgery, U.S. Serial No. 07/899,605  
 Aminomalonic Acid Antibodies, U.S. Patent Application Pending  
 Biofeedback System, U.S. Patent Application Pending  
 Bipolar and Monopolar Coagulation System That Prevents Sticking and Tearing, U.S. Patent Application Pending  
 Dental Instrument for Visualization, Sterilization, Diagnosis, and Therapy, U.S. Patent Application Pending  
 Cerebrospinal Fluid Shunt Capable of Minimal Invasive, China Application #93105689.6 Pending  
 Membrane Endoscopic Retractor, China Application #93106363.9 Pending  
 Membrane Endoscopic Retractor, EPO Application #93912255.2 Pending  
 Bladed Endoscopic Retractor, China Application #93107021.X Pending  
 Bladed Endoscopic Retractor, EPO Application #93911115.9 Pending  
 Bladed Endoscopic Retractor, PCT Application #PCTUS93/04297 Pending  
 Trocar Facilitator for Endoscopic Surgery, China Application #93109441.0 Pending  
 Trocar Facilitator for Endoscopic Surgery, EPO Application #93916553.6 Pending  
 Vascular Wound Closure Device, U.S. Patent Application #08/764611 Pending

Vascular Wound Closure Device, U.S. Patent Application #08/943369 Pending  
 Vascular Wound Closure Device, U.S. Patent Application #08/984757 Pending  
 Vascular Wound Closure System, PCT Application #PCTUS97/23133 Pending  
 Femoral Artery closure Facilitator, U.S. Application #60/009643 Pending  
 Vascular Wound Closure Device, PCT Application #PCTUS96/19937 Pending  
 Tissue Opening Locator and Everter and Method U.S. Application #09/092282 Pending  
 Universal Medical Tube Retainer and Nasal Wall Tissue Dilator, Filing Date: May 19, 1998  
 Closed End Implantable Drug Delivery System Catheter with Side Hole Tilting Towards the Direction of Blood Flow, Filing Date: 5/25/99  
 Trocar Facilitator for Endoscopic Surgery, U.S. Patent No. 5407427  
 Trocar and Method Endoscopic Surgery, U.S. Patent No. 54423484  
 Trocar Facilitator for Endoscopic Surgery and Method of Using the Same, U.S. Patent No. 5577993  
 Nasal Cannula Assembly, Filing Date:  
 Retractor/Dissector having Bendable Blade, Filing Date:  
 Everting Triceps, U.S. Application #60/144,763 Pending  
 Method for Urethral-Vesicle Anastomosis, U.S. Application #60/144,429 Pending

#### **BOOKS AND REVIEW ARTICLES:**

1. **Kirsch WM**, Schulz DW, Leitner JW: The quantitative histochemistry of the experimental glioblastoma: glycolysis and growth. *Acta Histochem.* 1967;28:51-85.
2. **Kirsch WM**, Grossi-Paoletti E, Paoletti P, Eds. *The Experimental Biology of Brain Tumors.* Springfield IL: Charles C Thomas Publisher; 1972.

#### **PAPERS AND BOOK CHAPTERS:**

1. **Kirsch WM**, Carlsson S, Hartmann A: A case of anomalous drainage of the superior vena cava into the left atrium. *J Thorac Cardiovasc Surg.* 1961;41:550-556.
2. **Kirsch WM**: Histochemical and quantitative analysis of alkaline phosphatase during the course of experimental intracranial neoplasia. *Neurology.* 1963;13:123-134.
3. **Kirsch WM**: Substrates of glycolysis in intracranial tumors during complete ischemia. *Cancer Res.* 1965;25:432-439.
4. **Kirsch WM**, Hodges FJ: An intramedullary epidermoid inclusion cyst of the thoracic cord associated with a previously repaired meningocele. *J Neurosurg.* 1966;24:1018-1020.
5. **Kirsch WM**, Leitner JW: Glycolytic metabolites and co-factors in human cerebral cortex and white matter during complete ischemia. *Brain Res.* 1967;4:358-368.
6. **Kirsch WM**, Leitner JW: A comparison of the anaerobic glycolysis of human brain and glioblastoma. *J Neurosurg.* 1967;27:45-51.
7. **Kirsch WM**, Leitner JW: An assay for organic phosphorus fractions in microgram quantities of tissue. *Ann Biochem.* 1967;21:39-45.
8. **Kirsch WM**: Quantitative changes in the phosphorus fractions of transplanted brain tumors during complete ischemic incubation. *Experientia.* 1967;23:586-588.

9. **Kirsch WM**, Leitner JW, Schulz DW: The effect of prolonged ischemia upon regional energy reserves in the experimental glioblastoma. *Cancer Res.* 1967;27:2212-2220.
10. **Kirsch WM**, Duncan B, Black FW, Stears JC: Laryngeal palsy in association with myelomeningocele, hydrocephalus and the Arnold-Chiari malformation. *J Neurosurg.* 1968;28:207-214.
11. Hsie AW, Rickenbert HW, Schulz DW, **Kirsch WM**: The steady-state concentration of glucose-6-phosphate, 6-phosphogluconate, and reduced NADPH in strains of *E. coli* sensitive and resistant to catabolite repression. *J Bacteriol.* 1969;98:1407-1408.
12. **Kirsch WM**, Newkirk JB, Predecki P: A new silicone rubber shunting device for the treatment of hydrocephalus. *J Surg Res.* 1969;1:199-203.
13. Black FO, **Kirsch WM**, Weaver M: Choristoma of the pharynx in a newborn. *Laryngoscope.* 1969;79:2068-2071.
14. **Kirsch WM**, Leitner JW: Comparison of anaerobic glycolysis of human brain and glioblastoma. *Yearbook of Cancer.* 1969:16-19.
15. Sussman KE, Alfrey A, **Kirsch WM**, Zweig P, Felig P, Messner F: Chronic lactic acidosis in an adult: A new syndrome associated with an altered redox state of certain NAD/NADH coupled reactions. *Am J Med.* 1970;48:104-112.
16. **Kirsch WM**, Newkirk JB, Predecki PK: Clinical experience with the Denver Shunt: A new silicone rubber shunting device for the treatment of hydrocephalus. *J Neurosurg.* 1970;32:258-264.
17. **Kirsch WM**, Stears JC: Case Report: Actinomycosis osteomyelitis of the skull and epidural space. *J Neurosurg.* 1970;33:347-351.
18. **Kirsch WM**: Pathophysiology of spina bifida. In: Proceedings Symposium on Spina Bifida, University of Colorado Medical Center; 1969 Nov:10-14.
19. **Kirsch WM**: Pathophysiology of hydrocephalus. In: Proceedings Symposium on Spina Bifida, University of Colorado Medical Center; 1969:93-103.
20. **Kirsch WM**, Newkirk JB, Predecki P: Polymers in neurosurgery: The development of a new silicone rubber shunting device for the treatment of hydrocephalus. In: Biomedical Materials, Polymer Conf. Series, U. Utah, College of Engineering; June 1970.
21. **Kirsch WM**, Leitner JW, Gainey M, Schulz DW, Lasher R, Nakane PK: Bulk isolation in non-aqueous media of nuclei from lyophilized cells. *Science.* 1970;168:1592-1595.
22. Hendee WR, **Kirsch WM**: Effects of ionizing radiation upon normal and neoplastic neural tissue. In: Kirsch, Paoletti and Paoletti, Eds. *The Experimental Biology of Brain Tumors.* Springfield IL: Charles C Thomas Publisher; 1972:400-518.
23. **Kirsch WM**, Schulz DW: Anaerobic energy metabolism of brain and derivative neoplasm. In: Kirsch, Paoletti and Paoletti, Eds. *The Experimental Biology of Brain Tumors.* Springfield IL: Charles C Thomas Publisher; 1972:275-298.
24. **Kirsch WM**, Schulz DW: The chemical induction of brain tumors with carcinogenic hydrocarbons and miscellaneous agents. In: Kirsch, Paoletti and Paoletti, Eds. *The Experimental Biology of Brain Tumors.* Springfield IL: Charles C Thomas Publisher; 1972:181-193.



25. **Kirsch WM**, Stears JC: Radiographic identification and surgical excision of an epidermoid tumor of the pineal gland: Case Report. *J Neurosurg.* 1970;33:708-713.
26. **Kirsch WM**, Schulz DW, Nakane PK, Lasher R, Yamamoto T: Isolation and characterization of glioblastoma nuclei and chromosomes in the lyophilized state. *J Neurosurg.* 1971;34:301-309.
27. **Kirsch WM**, Schulz DW: Regional bioenergetic events in the experimental glioblastoma. A quantitative histochemical study. *J Neurosurg.* 1971;34:448-451.
28. Lende R, **Kirsch WM**, Druckman R: Relief of facial pain after combined removal of precentral and postcentral cortex. *J Neurosurg.* 1971;34:537-543.
29. George RH, Sussman KE, Leitner JW, **Kirsch WM**: Inhibition of glucose and tolbutamide-induced insulin release by iodoacetate and antimycin A. *Endocrinology.* 1971;89:169-176.
30. **Kirsch WM**: Anaerobic energy metabolism of brain tumors. *Prog Exp Tumor Res.* 1972;17:163-191.
31. **Kirsch WM**, Schulz DW, Fuchs E, Nakane PK: The effect of ionizing radiation on nuclear energy transduction in normal and neoplastic glia: A quantitative chemical study. *Acta Radiol.* 1972;11:349-360.
32. Waddell WR, Bradshaw RA, Goldstein MN, **Kirsch WM**: Human nerve growth factor: Production in a patient with a liposarcoma. *Lancet.* 1972 Jun:1365-1367.
33. **Kirsch WM**: ACS Clinitape. Neuroanesthesia (Panel) Program Number C72-NS2. Cassette tape, American College of Surgeons Meeting. San Francisco; October 1972.
34. **Kirsch WM**: Book Review: *Biochemistry and the Central Nervous System*, by Henry McIlwain and H.S. Bachelard. *J Neurosurg.* 1973;38:532.
35. Van Buskirk JJ, **Kirsch WM**: Loss of hepatoma RNA during warfarin therapy. *Biochem Biophys Res Comm.* 1973;52:562-568.
36. **Kirsch WM**, Schulz DW, Van Buskirk JJ, Young HE: Effects of sodium warfarin and carcinostatic agents on malignant cells: A study of drug synergy. *J Med.* 1974;5:69-82.
37. **Kirsch WM**, Penn I, Stears JC: Neurosurgical complications associated with organ transplantation. In: Walker EA, Slade HW, Resnick BS, Eds. *Neurosurgery Review*, (cassette tape in the Professional Information Library, 130 Parkhouse, Dallas, Texas 75207), July 1974.
38. Ferguson JF, **Kirsch WM**: Case report: Epidural empyema following thoracic extradural block. *J Neurosurg.* 1974;41(6):762-763.
39. **Kirsch WM**: A new method of managing chronic pain. *Medical Times.* 1974 Nov;102:115-118.
40. **Kirsch WM**, Van Buskirk JJ, Schulz DW: Thoughts on the biology and therapy of malignant gliomas. In: *Recent Results in Cancer Research, Gliomas*. Berlin, Heidelberg, New York: Springer-Verlag; 1975;51:110-118.
41. **Kirsch WM**: Book Review: *Acromegaly*, by Jan Kinman. *J Neurosurg.* 1975;42:112-113.
42. Ignelzi RJ, **Kirsch WM**: Analysis of ventriculoperitoneal and ventriculoatrial shunts for hydrocephalus. *J Neurosurg.* 1975;42(6):679-682.

43. Tabuchi K, **Kirsch WM**: Immunocytochemical localization of S-100 protein in hamster cerebellum. *Brain Res.* 1975;92:175-180.
44. **Kirsch WM**, Ignelzi RJ: Cerebral edema: The role of astoglia. In: *Controversies in Neurosurgery*, Thomas Morley, Ed., W. B. Saunders Company, 1976:595-604.
45. Law JD, Lehman RAW, **Kirsch WM**, Ehni G: Abscess of the central ganglia. *J Neurosurg.* 1976;44(2):226-232.
46. **Kirsch WM**, Lewis JA, Simon RH: Experiences with electrical stimulation devices for the control of chronic pain. *Med Instrumentation.* 1975;9(5):217-220.
47. Tabuchi K, Lehman J, **Kirsch WM**: Immunocytochemical localization of simian virus 40 T-antigen with peroxidase labeled antibody fragments. *J Virology.* 1976;17(2):668-671.
48. **Kirsch WM**, Van Buskirk JJ, Schulz DW, Tabuchi K: The biologic basis of malignant brain tumor therapy. In: *Advances in Neurology.* Raven Press; 1976;15:301-313.
49. Tabuchi K, **Kirsch WM**, Nakane PK: The fine structural localization of S-100 protein in rodent cerebellum. *J Neurol Sci.* 1976;28:65-76.
50. Wilson B, **Kirsch WM**, et al.: Monitoring of visual function during parasellar surgery. *Surg Neurol.* 1976 Jun;5(6):323-329.
51. Tabuchi K, **Kirsch WM**, Van Buskirk JJ, Schulz DW: Immunocytochemical evidence for SV40-related tumor antigen in two human brain tumors of ependymal derivation. *Acta Neurochirurgica.* 1978;43:239-249.
52. **Kirsch WM**: Book Review: *Brain Tumor Chemotherapy*, by Derek Fewer, Charles B. Wilson, Victor A. Levin.. *JAMA.* 1977 4/Apr;237:1494.
53. Tabuchi K, Nishimoto A, **Kirsch WM**, Van Buskirk JJ: Screening of human brain tumors for SV40-related T antigen. *J Neurol Medico-Chirurgica (Tokyo).* 1977;17II(5):383-390.
54. Van Buskirk JJ, **Kirsch WM**: The occurrence of gammacarboxyglutamic acid in mammalian ribosomes. *Biochem Biophys Res Comm.* 1978;80(4):1033-1038.
55. Tabuchi K, **Kirsch WM**, Low M, Gaskin D, Van Buskirk JJ, Maa S: Screening of human brain tumors for SV40-related T antigen. *Int J Cancer.* 1978;21:12-17.
56. Tucker WS, **Kirsch WM**, Martinez-Hernandez A, Fink LM: *In vitro* plasminogen activator activity in human brain tumors. *Cancer Res.* 1978 Feb;8:297-302.
57. Law JD, Lehman RAW, **Kirsch WM**: Reoperation after lumbar intervertebral disc surgery. *J Neurosurg.* 1978;48:259-263.
58. **Kirsch WM**, Ferguson JF, Ignelzi RJ: Regional differences in arterial metabolic rates: Its significance in relation to cerebral vasospasm. In: J Cervos-Navarro, et al., Eds. *Advances in Neurology*, Vol. 20, Pathology of Cerebrospinal Microcirculation. New York: Raven Press; 1978 Jun:47-57.
59. Ignelzi RJ, **Kirsch WM**: Sodium sequestration in vertebrate glial nuclei implications in the pathogenesis of ischemic brain injury. In: J Cervos-Navarro, et al., Eds. *Advances in Neurology*, Vol. 20, Pathology of Cerebrospinal Microcirculation. New York: Raven Press; 1978 Jun:231-236.

60. **Kirsch WM**, Tucker WS, Tabuchi K, Fink LM, Van Buskirk JJ: The metabolism of the glioblastoma: Pathobiological correlates. In: *Clinical Neurosurgery*, Vol. 25, Chap. 20. Baltimore: Williams & Wilkins Co; 1978:310-325.
61. Coyer B, Pryor JR, **Kirsch WM**, Blount SG, Jr.: Left stelletomy in the long QT syndrome. *Chest*. 1978 Nov;74:584-586.
62. Van Buskirk JJ, **Kirsch WM**: Gamma carboxyglutamic acid in eukaryotic and prokaryotic ribosomes. *Biochem Biophys Res Comm*. 1978;82(4):1329-1331.
63. Tabuchi K, **Kirsch WM**: Detection of IgG on glioblastoma cell surface *in vivo*. *Acta Neurochirurgica*. 1978;43:93-100.
64. Jawadi HM, **Kirsch WM**, Lock JP, Betz G: Hydrocephalus and amenorrhea. *Obstet Gynecol*. 1979 Feb;53(2):263-266.
65. Batt J, Cox RL, Hoke CH, **Kirsch WM**, et al.: False positive gram stains due to non-viable organisms in sterile commercial transport medium-Colorado, Ohio. *Morbidity Mortality Weekly Rep*. 1978;27:23.
66. **Kirsch WM**: Head Injuries. In: Bernard Gardner, et al., Eds. *Basic Surgery: A Symptom-Oriented Approach*, Chap. 36. New York: Appleton-Century-Crofts; 1978:505-513.
67. Tabuchi K, Nishimoto A, **Kirsch WM**: Immunoelectronmicroscopic localization of S-100 protein in cultured rat glioma cells. *Acta Neuropath (Berl.)*. 1978;44:159-162.
68. Handel N, Law J, Hoehn R, **Kirsch WM**: Monitoring visual evoked response during craniofacial surgery. In: *Annals of Plastic Surgery*, Vol. 2, No. 3. Boston: Little, Brown, & Co.; March 1979.
69. **Kirsch WM**, Van Buskirk JJ, Low M, Tabuchi K, Tucker WS, Fink LM: Examination of the ribosome as a control point for malignant glial tumors. In: P. Paoletti, M.D. Walker, G. Butti, and R. Knerich, Eds. *Proceedings of the International Symposium on Multidisciplinary Aspects of Brain Tumor Therapy*, Gardone Riviera, Italy, June 8-10, 1979. Baltimore: Elsevier/North Holland Press; 1979.
70. Van Buskirk JJ, Low M, **Kirsch WM**: Growth-related changes in the carboxylation of the *E. coli* ribosomes. Proc. Eighth Steenbock Symp. In: J.W. Suttie, Ed., *Vitamin K Metabolism: Vitamin K-Dependent Proteins*. Baltimore: University Park Press; 1979:274-278.
71. Low M, Van Buskirk JJ, **Kirsch WM**: Detection of gamma carboxyglutamic acid by dansylation. Proc. Eighth Steenbock Symp. In: J.W. Suttie, Ed., *Vitamin K Metabolism: Vitamin K-Dependent Proteins*. Baltimore: University Park Press; 1979:150-152.
72. Jafek BW, Krekorian EA, **Kirsch WM**, Wood RP: Juvenile nasopharyngeal angiofibrom: Management of intracranial extension. *Head Neck Surg*. 1979;2:119-128.
73. **Kirsch WM**, et al.: Intracranial tumors: Their pathophysiology, specific properties, and prospects for future control. In: Roger N. Rosenberg, MD, Ed., *The Science and Practice of Clinical Medicine*, Vol. 5 - Neurology. New York: Grune & Stratton, Inc.; 1980:319-369.
74. **Kirsch WM**, Vogel H: Gliomas. In: Ben Eiseman, Ed., *Prognosis of Surgical Disease*. Philadelphia: W.B. Saunders & Co.; 1980:24-25.
75. Law JD, Swett J, **Kirsch WM**: Retrospective analysis of 22 patients with chronic pain treated by peripheral nerve stimulation. *J Neurosurg*. 1980;52:482-485.

76. Tobuchi K, Nishimoto A, **Kirsch WM**: Localization of SV40 T-antigen in mitotic cells by an immunoperoxidase method. *Experientia*. 1980;36(9):1053-1054.
77. Christy RM, Barkley RM, Koch TH, Van Buskirk JJ, **Kirsch WM**: The new amino acid, -carboxyaspartic acid (ASA). Laboratory synthesis and identification in the ribosomal proteins of *E. coli* and subsequent synthesis. *J Am Chem Soc*. 1981;103(13):3935-3937.
78. Koch TH, Christy MR, Barkley RM, Sluski R, Bohemier D, Van Buskirk JJ, **Kirsch WM**: - Carboxyaspartic acid (ASA): *Methods Enzymol*. 1984;107:563-575.
79. Van Buskirk JJ, **Kirsch WM**, Kleyer DL, Barkley RM, Koch TH: Aminomalonic acid: Identification in *E. coli* and atherosclerotic plaque. *Proc Natl Acad Sci*. 1984 Feb;81(3):722-725.
80. Kanter K, Kanter M, **Kirsch WM**, Rosenberg G: Spontaneous posterior fossa subdural hematoma as a complication of anticoagulation. *Neurosurg*. 1984;15:241-242.
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131. Swensen R, **Kirsch W**. Brain neoplasms in women: A review. *Clin Obstet Gynecol*. 2002;45(3):904-927.

#### SELECTED ABSTRACTS (1990-present):

1. **Kirsch WM**, Zhu YH, et al.: Arterial Reconstruction Utilizing Bovine Pericardial Prosthesis and Non-Penetrating Clips During the Course of Aneurysm Surgery. Neurosurgical Society of America, Pebble Beach, California, April 11, 1990.
2. **Kirsch WM**, Zhu YH, et al.: Arterial Reconstruction Utilizing Bovine Pericardial Prosthesis and Non-Penetrating Clips During the Course of Aneurysm Surgery. Tenth International Symposium, Microsurgery for Cerebrovascular Disease, San Francisco, California, July 14, 1990.
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4. Fowler SD, **Kirsch WM**, et al.: Aminomalonic Acid (AMA) Detected in Select Proteins from Granuloma Foam Cells by Gas Chromatography/Mass Spectrometry. 75th Annual Federation of American Societies for Experimental Biology Meeting, Atlanta, Georgia, April 21-25, 1991.
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6. Fowler SD, **Kirsch WM**, et al.: Monoclonal Antibody to Aminomalonic Acid (AMA) Epitope Reactive to Arterial and Granuloma Foam Cells. 75th Annual Federation of American Societies for Experimental Biology Meeting, Atlanta, Georgia, April 21-25, 1991.
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8. Fowler SD, **Kirsch WM**, et al.: Isolation and Characterization of Aminomalonic Acid (AMA) Enriched Proteins from Granuloma Foam Cells. 75th Annual Federation of American Societies for Experimental Biology Meeting, Atlanta, Georgia, April 21-25, 1991.
9. **Kirsch WM**, Zhu YH: Venous Reconstruction with a Novel Non-Penetrating Clip: Endoscopic Extension of the Technology to Other Approximations. Research Society of Neurological Surgeons, Duke University Medical Center, Durham, North Carolina, May 4, 1991.
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12. Hardesty RA, **Kirsch WM**, Webster M, Furnas D, Cushman, R: A New Microclip for Microvascular Anastomoses: Report of Experimental and Clinical Research. The Seventh Annual Meeting of the American Society For Reconstructive Microsurgery, Orlando, Florida, September 28-30, 1991.
13. **Kirsch WM**, Zhu YH: Use of A Microclip Via Minimally Invasive Surgery For Anastomosis and/or Closure of Tissue. World Congress of Gynecologic Endoscopy, The American Association of Gynecologic Laparoscopists 20th Annual Meeting, Las Vegas, Nevada, November 13-17, 1991.
14. **Kirsch WM**, Zhu YH, Hardesty RA: A New Method for Microvascular Anastomosis: Report of Experimental and Clinical Research. American College of Surgeons, Southern California Chapter, Indian Wells, California, January 17, 1992.
15. Kirsch C, Sillerud L, Zhu YH, **Kirsch WM**, Pennino R: Monitoring of Nerve Repair and Wallerian Degeneration by NMR Spectroscopy. Joint Section on Disorders of the Spine and Peripheral Nerves of the American Association of Neurological Surgeons and the Congress of Neurological Surgery, Miami, Florida, February 7, 1992.
16. Gulley J, **Kirsch WM**, Fowler S, Nehlsen-Cannarella S: Monoclonal Antibodies to Aminomalonic Acid-Containing Epitopes from a Human Prostate Carcinoma Cell Line (DU-125). 76th Annual Federation of American Societies for Experimental Biology Meeting, Anaheim, California, April 8, 1992.
17. Webster M, **Kirsch WM**: Clinical Experience with the "Kirsch" Microclip in Microvascular Anastomosis. European Association of Plastic Surgeons, Pisa, Rome, May 15, 1992.
18. Hardesty RA, Nguyen T, Oberg K, **Kirsch WM**: Intra-Uterine Cleft Lip Repair Using the Kirsch Micro-Clip. Tri-County Surgical Society, Loma Linda, California, May 21, 1992.
19. Boukouvalas Z, **Kirsch WM**, Zhu YH, Hardesty RA: A New Surgical Technique for Venous Reconstruction: The Non-Penetrating Clip. First Congress of the International Society for Experimental Microsurgery, Rome, Italy, August 24, 1992.



20. Zhu YH, **Kirsch WM**, Stewart SC, Gaskill DM: Non-Penetrating Clips Replacing Sutures: Endoscopic Applications. First Congress of the International Society for Experimental Microsurgery, Rome, Italy, August 24, 1992.
21. **Kirsch WM**, Zhu YH, Stewart SC, Gaskill DM: Non-Penetrating Clips Replacing Sutures. International Congress of Gynecologic Endoscopy, AAGL 21st Annual Meeting, Chicago, Illinois, September 23-27, 1992.
22. **Kirsch WM**, Zhu YH, Stewart SC, Gaskill DM: A New Technique for Microsurgical Anastomoses: Report of Experimental and Clinical Research. International Congress of Gynecologic Endoscopy, AAGL 21st Annual Meeting, Chicago, Illinois, September 23-27, 1992.
23. **Kirsch WM**, Zhu YH, Stewart SC, Gaskill DM: Non-Penetrating Clips Replacing Sutures. 6th International Conference, The Korean Vascular Surgery Society, Seoul, Korea, October 1-3, 1992.
24. **Kirsch WM**, Zhu YH: A New Surgical Technique for Venous Reconstruction: The Non-Penetrating Clip. 6th International Conference, The Korean Vascular Surgery Society, Seoul, Korea, October 1-3, 1992.
25. **Kirsch WM**, Zhu YH, Hardesty RA: A New Method for Microvascular Anastomosis: Report of Experimental and Clinical Research. 6th International Conference, The Korean Vascular Surgery Society, Seoul, Korea, October 1-3, 1992.
26. Gaskill DM, Stewart SC, **Kirsch WM**, Zhu YH: Sutureless Vasovasostomy: A New Technique Demonstrating an Experimental Microclip Using a Rat Model. 48th Annual Meeting of the American Fertility Society in New Orleans, Louisiana, November 4, 1992.
27. Evans M, Oberg K, **Kirsch WM**, Hardesty RA: Intrauterine Cleft Lip Repair. American College of Surgeons, Southern California Chapter, Santa Barbara, California, January 24, 1993.
28. Robinson J, Oberg K, **Kirsch WM**, Wood V: Intrauterine Repair of Syndactyly. American College of Surgeons, Southern California Chapter, Santa Barbara, California, January 24, 1993.
29. **Kirsch WM**, Zhu YH, Hardesty RA, Petti G, Furnas D: Non-Penetrating Clips Successfully Replacing Sutures in "Base of Skull" Surgery. North American Skull Base Society Meeting, Scottsdale, Arizona, February 12-14, 1993.
30. **Kirsch WM**, Zhu YH: A New Surgical Technique for Venous Reconstruction: The Non-Penetrating Clip. North American Skull Base Society, Scottsdale, Arizona, February 12-14, 1993.
31. Oberg KC, Evans M, Nguyen T, **Kirsch WM**, Hardesty RA: Intrauterine Cleft Lip Repair in the Mouse: A Preamble to Endoscopic Intrauterine Surgery. American Cleft Palate-Craniofacial Association, Pittsburgh, Pennsylvania, April 21, 1993.
32. **Kirsch WM**, Zhu YH: The Non-Penetrating Clip. Research Society of Neurological Surgeons Conference, Mater Private Hospital, Dublin, Ireland, June 10, 1993.
33. Robinson, J, Oberg KC, **Kirsch WM**, Wood VE: Intrauterine Repair of Synactyly. The 48th Annual Meeting of the American Society for Surgery of the Hand, Kansas City, Missouri, September 29-October 2, 1993.
34. Tredway DR, **Kirsch WM**, Zhu YH: A New Concept for Endoscopic Reanastomoses of the Fallopian Tube. International Congress of Gynecologic Endoscopy, AAGL 22nd Annual Meeting, San Francisco, California, November 13, 1993.

35. **Kirsch WM**, Oberg K, Zhu YH, Hardesty RA, Wood V, Tredway D, Stewart S, Gaskill D: Non-Penetrating Clips Replacing Sutures: Gynecologic Applications. International Congress of Gynecologic Endoscopy, AAGL 22nd Annual Meeting, San Francisco, California, November 13, 1993.
36. **Kirsch WM**, Zhu YH, Hardesty RA, Petti G, Furnas D: Nonpenetrating Clips Successfully Replacing Sutures in Base of Skull Surgery. *Skull Base Surg.* 3(4):171-183, 1993.
37. **Kirsch WM**, Wahlstrom E, Raithel D, Buttner P, Katzman H, Zhu Y, Scott J, St John-Hammond PG. A Multi-Centered Controlled Clinical Trial Comparing Clips to Suture for Construction of Hemodialysis Vascular Access Sites. 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, September 15-18, 1996.
38. **Kirsch WM**, Zhu Y, Steckel R, O'Malley D, Oberg K, Hardesty R: Comparative Evaluation of Suture and Non-Penetrating Titanium Clips for Vascular Reconstruction. 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, September 15-18, 1996.
39. Palm S, Reiser K, **Kirsch WM**, Zhu Y, Peckham N, Nelsen-Cannarella S, Kihara S, Oberg K, Hardesty R: Arterial Collagen Bonding by Pressure: A New Paradigm in Wound Healing. 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, September 15-18, 1996.
40. **Kirsch WM**, Zhu Y, Wang Z, Balzer K, Raithel D, Wahlstrom E, Hill A, Webster M, Hardesty R, Oberg K, Kihara S: Complex Vascular Reconstructions Facilitated by Non-Penetrating Arcuate-Legged Clips. 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, September 15-18, 1996.
41. Zhu YH, **Kirsch WM**: Vascular reconstructions are facilitated by non-penetrating arcuate-legged clips. American Academy of Neurological Surgeons, 59th Annual Meeting, Banff, Alberta Canada, September 10-13, 1997.
42. **Kirsch WM**, Hardesty RA: Frontal Cranial Bone Advancement: What Happens to the Dead Space? Kim DB, Anton T, Afifi G, Plastic Surgery Research Council Meeting, April, 1998.
43. Chai YH, **Kirsch WM**, Anton T, Thorpe DL: Comparison of suture and non-penetrating vascular clip: *J Investigative Med*; 47(2)/92A/99.
44. **Kirsch WM**, Zhu YH, Dickson C, Kim P, Konkin T, Anton L, Reyes MY: What's new in the use of vascular clips: What are their assets, liabilities and pitfalls. 26th Annual Symposium on Current Critical Problems, New Horizons & Techniques in Vascular and Endovascular Surgery, New York City, 11/20/99.
45. **Kirsch WM**, Palm S, Zhu YH, Anton T, Reyes MY, Anton L, Anton R: Clipped durapiasties: An experimental study and clinical application. 2000 Annual Meeting of the American Association of Neurological Surgeons, San Francisco, CA, 4/8-13/00.
46. Kirsch WM, Anton T, Cavallo CA, Zhu YH, Martin R, Anton L; A five year study of "sutureless" cerebrovascular reconstructions: Assets and liabilities; 5<sup>th</sup> Congress of the International Society for Experimental Microsurgery; 9/4/00; Catania, Italy.
47. Kirsch WM, Hendricks D, Eichenberg B, Zhu YH, Anton L; Microvascular free tissue transfer in the presence of coagulation and vessel disorders: Recognition and Solutions; 5<sup>th</sup> Congress of the International Society for Experimental Microsurgery; 9/6/00; Catania, Italy.
48. Zhu YH, **Kirsch WM**, Wang ZG, Hendricks D, Eichenberg B, Anton L. Clinical trial of vascular closure system in the presence of coagulation and vessel disorders. Sutureless anastomosis workshop. 32<sup>nd</sup> World Congress of the International College of Surgeons, Singapore, 10/8-12/00.

49. Kirsch WM; The use of non-penetrating clips for dural reconstruction. 2000 Annual Clinical Assembly of Osteopathic Specialists; 9/22/00; Boston, MA.
50. Kirsch WM; The use of non-penetrating clips in vascular surgery. 2000 Annual Clinical Assembly of Osteopathic Specialists; 9/22/00; Boston, MA.
51. Kirsch WM; Update on vascular clips: Can they be used endoluminally and for venous repairs; 27<sup>th</sup> Annual Symposium on Vascular and Endovascular Issues, Techniques, Horizons; 11/19/00; The Marriott Marquis, New York City.
52. Kirsch WM, Hendricks DL, Eichenberg B, Zhu YH, Anton L; Microvascular free tissue transfer in the presence of coagulation and vessel disorders: Recognition and solutions; Annual Meeting Am Soc for Reconstructive Microsurgery; 1/13-16/01; San Diego, CA.
53. Kirsch WM, Zhu YH, Anton L, Jessop N, Boyne P, Schubert C, Rajhansa D, Sapiente JR, Pedros R, Dickson C, Rotan E, Shafipour P; The new "Micro Surgiclip®" – A comparative study; 53<sup>rd</sup> Annual Meeting Neurosurg Soc Am; 6/6-10/01; Amelia Isl, FL.
54. Kirsch WM, Zhu YH, Steckel R, Concepcion W, Oberg K, Anton L, Peckham N; In vivo remodeling of surgically constructed vascular anastomoses: Non-penetrating, arcuate-legged clips versus standard suture (poster presentation); BECON 2001 Reparative Medicine: Growing Tissues and Organs; 6/25-26/01; NIH, Bethesda, MD.
55. Kirsch WM. Invited lecture on Dementias. Neuroscience Symposium by Doctors Medical Center of Modesto, California Neurological Sciences Center; 10/19-21/01; Olympic Valley, CA.
56. Kirsch WM. Invited lecture on Malignant Gliomas. Neuroscience Symposium by Doctors Medical Center of Modesto, California Neurological Sciences Center; 10/19-21/01; Olympic Valley, CA.
57. Kirsch WM. The Biology of the VCS Vascular Clip in Vascular Anastomosis. American College of Surgeons; 4/14-17/02; San Diego, CA.
58. Kirsch WM, Zhu YH, Anton L, Jessop N, Boyne PJ, Schubert C, Dickson C, Shafipour P, Rotan E, Weller S. The new Microsurgiclip® - A comparative study. 6<sup>th</sup> Congress of the International Society for Experimental Microsurgery, 8/21-24/02; San Diego, CA.
59. Kirsch WM, Concepcion W, Anton L, Dickson C, Baron P, Hakim N. Facilitated liver transplantation and living donor hepatic resection with automated microvascular clips: A review of clinical and experimental studies. 6<sup>th</sup> Congress of the International Society for Experimental Microsurgery, 8/21-24/02; San Diego, CA.
60. Kirsch WM, Anton T, Cavallo C, Zhu YH, Rouse G, Martin R, Leocadio D. A new system for cerebrovascular reconstructions: Non-penetrating arcuate-legged clips. 6<sup>th</sup> Congress of the International Society for Experimental Microsurgery, 8/21-24/02; San Diego, CA.

**INVITED LECTURES, VISITING PROFESSORSHIPS, AND PAPERS PRESENTED AT MEETINGS  
(1969 to present): TOTAL: 195**

1. Boston Surgical Society, Harvard Club, "Treatment of Cancer with Warfarin," May 1969, Invited.
2. Neuroscience Symposium, Washington University School of Medicine, St. Louis, Missouri, Invited, May 1970.

3. Biomedical Materials Conference, University of Utah Medical School, Salt Lake City, Utah, Invited, June 1970.
4. Chairman, Radiotherapy Session, Neuroradiology Congress, Gotenberg, Sweden, Invited, August 1970.
5. Institute of Medical Genetics, Oslo, Norway, "Isolation of Non-Aqueous Nuclei," Invited, August 1970.
6. Pasteur Institute, Department of Molecular Biology, "Isolation of Non-Aqueous Nuclei," Invited, September 1970.
7. International Neuropathology Congress, Paris, France, "Histochemistry of Brain Tumors," Invited, August 1970.
8. Ohio State University Centennial Celebration, Ohio State University Medical School, Neurosurgery Department, Columbus, Ohio, Invited, October 1970.
9. American College of Surgeons, Chicago, Illinois, Chairman, Fundamental Forum Session on Neurosurgery, Invited, October 1970.
10. Chairman of Neurosurgical Session, Association of Academic Surgeons, Denver, Colorado, Invited, November 1970.
11. Visiting Professor, Northwestern University School of Medicine, Section on Neurosurgery, Chicago, Illinois, November 1970.
12. Western Surgical Association, Colorado Springs, Colorado, Invited, November 1970.
13. Chicago Wesley Memorial Hospital, Chicago, Illinois, Invited, December 1970.
14. National Cancer Institute, Basic Science Seminar, Bethesda, Maryland, "Isolation and Characterization of Brain Tumor Nuclei in the Lyophilized State," Invited, January 1971.
15. National Cancer Institute, National Institutes of Health, Bethesda, Maryland, Invited, February 1971.
16. American Association of Neurological Surgeons, Houston, Texas, "Combination Drug and Irradiation Therapy for Surgically Incurable Tumors of the Neuraxis," April 1971.
17. Visiting Professor, Max Planck Institute for Brain Research, Cologne, West Germany, two lectures on brain tumors, Invited, April 1971.
18. Observation to the Pathogenesis of Cerebral Edema - Academy Award for 1971.
19. Department of Neurosciences, University of California, San Diego, California, "The Biology of Gliomas," November 1971.
20. Johns Hopkins Hospital, Baltimore, Maryland, guest lecturer at the Neurology- Neurosurgery Science Seminar, December 1971.
21. Science Writers' Seminar, American Cancer Society, Clearwater Beach, Florida, Invited Participant, March 1972.
22. American Association of Neurological Surgeons, Boston, Massachusetts, "A Histochemical Examination of Pituitary Adenomas with Enzyme-Labeled Antibodies," April 1972.

23. Visiting Professor, Symposium on Neurosurgery, Free University of Berlin, Berlin, Germany, "Chemotherapy of Brain Tumors: The Biologic Basis" keynote speaker, May 1972.
24. Society of Neurological Surgeons, New Haven, Connecticut, "A Histochemical Examination of Pituitary Adenomas," May 1972.
25. Neurosurgical Clinic, Karolinska, Stockholm, Sweden, Invited Lecturer, "Chemotherapy of Brain Tumors," May 1972.
26. Second International Meeting of the International Society of Neurochemistry, Milano, Italy, Moderator and Panelist, "Biochemistry of Brain Tumors".
27. 69th Annual Meeting, Wyoming State Medical Society, Moran, Wyoming, Chairman, Scientific Sessions on "Proper Management and Recognition of Neurosurgical Problems Related to Head and Neck Trauma," and "Recognition and Management of Cerebral Tumors in General," Invited, August 1972.
28. American Academy of Neurological Surgery, Society of British Neurological Surgeons, Oxford, England, "Combination Drug and Irradiation Therapy for Surgically Incurable Tumors of the Neuraxis," September 1972.
29. Congress of Neurological Surgeons, Denver, Colorado, Invited Speaker, October 1972.
30. Western Neurosurgical Society, Tucson, Arizona, co-author of award-winning paper, "Sodium Compartmentalization in Vertebrate Brain Nuclei and the Biological Implications of this Discovery in the Human," October 1972.
31. American College of Surgeons, San Francisco, California, Moderator of Panel, "Neuroanesthesia," Invited, October 1972.
32. St. Louis Neurological and Neurosurgical Society, St. Louis, Missouri, "Combination Drug and Irradiation Therapy for Surgically Incurable Tumors of the Neuraxis," November 1972.
33. National Cancer Institute, National Institutes of Health, Bethesda, Maryland, "Anti-Coagulants and Cancer," December 1972.
34. Treatment of Cancer Symposium, Philadelphia, film and lecture, "Combination Drug and Irradiation Therapy for Surgically Incurable Tumors of the Neuraxis," December 1972.
35. Institute of Medical Science, University of Toronto, Toronto, Ontario, Workshop on Brain Tumors; special lecture, "The Biology of Gliomas," February 1973.
36. Visiting Professor, Southwestern Medical School, Division of Neurosurgery, Dallas, Texas, "Combination Drug and Irradiation Therapy for Surgically Incurable Tumors of the Neuraxis," March 1973.
37. American Association of Neurological Surgeons, Los Angeles, California, "Synchronization of Glioblastoma Cells *In Vitro* by Sodium Warfarin: Therapeutic Implications," April 1973.
38. Neurosurgical Society of America, Bermuda, "Neurosurgical Complications Associated with Organ Transplantation," June 1973.
39. Harvard Medical School, Department of Neurosurgery, Boston, Massachusetts, Beth Israel Hospital, "Neurosurgical Complications Associated with Organ Transplantation," Invited, June, 1973.
40. Visiting Professor, University of Hokkaido School of Medicine, Sapporo, Japan, special lecture on "The Biology of Gliomas," Invited, October 1973.

41. Visiting Professor, Okayama University School of Medicine, Okayama, Japan, special lecture on "Chemotherapy of Brain Tumors," Invited, awarded Silver Medal, October 1973.
42. International Congress of Neurological Surgery, Tokyo, Japan, "A Histochemical Examination of Pituitary Adenomas with Enzyme-Labeled Antibodies," October 1973.
43. National Cancer Institute, National Institutes of Health, Bethesda, Maryland, "Anticoagulation in the Treatment of Cancer," Invited Participant, November 1973.
44. American Academy of Neurological Surgeons, Pasadena, California, "Neurosurgical Complications Associated with Organ Transplantation," November 1973.
45. Research Society of Neurological Surgeons, Richmond, Virginia, "Thoughts on the Biology and Therapy of Brain Tumors," Invited by University of Virginia Cancer Research Center, March 1974.
46. American Association of Neurological Surgeons, St. Louis, Missouri, Special Symposium: The Biology of Gliomas, Invited, April 1974.
47. Visiting Professor, Bowman Gray School of Medicine, Winston-Salem, North Carolina, Invited, May 1974.
48. Symposium on Cerebral Gliomas, University of Chicago, "Thoughts on the Biology and Therapy of Malignant Gliomas," May 1974.
49. Guest Speaker, The Upjohn Company, Kalamazoo, Michigan, "Chemotherapy of Brain Tumors," Invited, May 1974.
50. Neurosurgical Society of America, Key Biscayne, Florida, "Management of Metastatic Tumors to the Central Nervous System," May 1974.
51. Guest Speaker, Congress of Neurological Surgeons, "Transsphenoidal Hypophysectomy," Vancouver, British Columbia, September 1974.
52. American College of Surgeons, Miami, Florida, "Pharmacokinetic Basis of Brain Tumor Chemotherapy," October 1974.
53. American Academy of Neurological Surgery, Bermuda, "Six Years of Experience with Chemotherapy for Malignant Tumors of the Neuraxis," November 1974.
54. Hand Society, Denver, Colorado, "Management of Peripheral Nerve Injuries to the Hand," Invited, January 1975.
55. 2nd Annual Barrow Neurological Institute Symposium, Phoenix, Arizona, "Biologic Basis of Malignant Brain Tumor Therapy," Invited, January 1975.
56. Pan Pacific Surgical Association, Honolulu, Hawaii, Invited Lecturer for two topics: "Brain Tumor Therapy," and "Advances in Management of Hydrocephalus," February 1975.
57. Southern Research Institute, Birmingham, Alabama, Invited Lecturer, "Brain Tumor Chemotherapy," February 1975.
58. Neurosurgical Society of America, Rancho Bernardo, California, "VER Monitoring of Visual Function During Parasellar Surgery," March 1975.

59. 25th Western Institute on Epilepsy, "New Concepts in Treatment and Rehabilitation in Epilepsy," Denver, Colorado, Invited, March 1975.
60. American Association of Neurological Surgeons, Miami, Florida, "Identification of a Unique Particle from Ewing's Sarcoma Involving the Cranial Vault," "Pyogenic Abscess of the Basal Ganglia," and "VER Monitoring of Visual Function During Parasellar Surgery," April 1975.
61. Visiting Professor, University of Kansas Medical Center, Invited Lecturer for two topics, "Biologic Basis of Brain Tumor Therapy," and "The Management of Secreting Pituitary Tumors," Kansas City, Kansas, May 1975.
62. Visiting Professor, Neurosurgical Service, University of California, San Francisco, California, Invited, October 1975.
63. Guest Lecturer, New York University Post Graduate Conference, New York, New York, "Brain Tumor Management," October 1975.
64. Invited Lecturer, Cook County Graduate School of Medicine, "Tumor Chemistry, Immunology, and Kinetics," February 1976.
65. Guest Lecturer, Free University of Berlin, Germany, "Immunocytochemistry: Implications for Advances in the Neurosciences," February 1976.
66. Neurosurgical Society of America, Marco Island, Florida, "Advances in the Biology of Human Brain Tumors," and moderated discussion of brain tumors, March 1976.
67. American Association of Neurological Surgeons, San Francisco, California, "Detection of IgG in Glioblastoma Cells," April 1976.
68. Thirteenth Meeting of the Rocky Mountain Bioengineering Symposium, "Minicomputer Detection of Pain," May 1976.
69. Visiting Professor, Neurosurgical Service, University of Southern California, August 22-25, 1976.
70. Western Neurosurgical Society, Reno, Nevada, "Screening Human Brain Tumors for SV40-Related T-Antigen," September 26-29, 1976.
71. Invited Lecturer, Cook County Graduate School of Medicine, Chicago, Illinois, "Tumor Chemistry - Immunology - Kinetics," February 1977.
72. Visiting Professor, Rockefeller University, New York, Laboratory of Dr. Elaine Diakumakos, June 22-July 8, 1977.
73. Congress of Neurological Surgeons, San Francisco, California, "Metabolism of Brain Tumors," and "Central Pain," Invited, October 9-14, 1977.
74. American Academy of Neurological Surgery, Kamuela, Hawaii, "The Effect of Left Stellate Ganglionectomy upon Certain Cardiac Arrhythmias," November 2-5, 1977.
75. Visiting Professor, Neurosurgery Service, Mt. Sinai Medical School, New York, December 15-20, 1977.
76. Cook County Graduate School of Medicine, "Brain Tumors," Invited Speaker, February 8-11, 1978.

77. American Association of Neurological Surgeons, Invited Panelist. "Firing Line Panel of Experts," April 25-27, 1978.
78. Research Society of Neurological Surgeons, Columbia University School of Medicine, "GLA in Ribosomal Proteins," June 1-3, 1978.
79. Visiting Professor, Division of Radiation Oncology, Oncology Center, The Johns Hopkins Hospital, September 7-8, 1978.
80. Visiting Professor, Neurosurgery Service, Bethesda Naval Hospital, Bethesda, Maryland, December 14-16, 1978.
81. Cook County Graduate School of Medicine, Invited Speaker. "Brain Tumors: Immunology, Biochemistry, Kinetics," February 1979.
82. Invited Speaker, Washington Academy of Neurosurgery, Washington, D.C., December 12, 1978.
83. Program Chairman, Neurosurgical Society of America, 32nd Annual Meeting, The Greenbrier, White Sulphur Springs, West Virginia, May 23-27, 1979.
84. Visiting Professor, Medical College of Virginia, Neurosurgery Service, May 1979.
85. International Symposium on the Biology and Therapy of Brain Tumors, Invited Participant, Lake Garda, Italy, June 8-10, 1979.
86. Frie University, West Berlin/Max Planck Institute for Molecular Genetics. Invited Speaker, "GLA in Ribosomal Proteins," June 1-3, 1979.
87. American College of Surgeons, 65th Clinical Congress, Moderator of Panel, "What's New in the Laboratory That Can be Applied to Clinical Neurosurgery," Chicago, Illinois, October 21-26, 1979.
88. Visiting Professor, University of New York, Roswell Park, Buffalo, New York, January 1980.
89. Cook County Graduate School of Medicine, Review Course in Neurological Surgery, Invited Speaker. "Brain Tumors: Immunology, Biochemistry, Kinetics," February 1980.
90. Visiting Professor, University of Chicago Hospitals, Chicago, Illinois, February 1980.
91. Visiting Professor, Loyola University School of Medicine, Division of Neurosurgery, February 1980.
92. Cook County Graduate School of Medicine, Review Course in Neurological Surgery, Invited Speaker, "Brain Tumors: Immunology, Biochemistry, Kinetics," February 1981.
93. American Association of Neurological Surgeons (Cushing), Invited Panelist. "Breakfast Seminar, #56 - Firing Line," "The Ribosome as a Therapeutic Control Point for Malignant Tumors Involving the Neuraxis," April 5-9, 1981.
94. Cook County Graduate School of Medicine, Review Course in Neurological Surgery, Invited Speaker, "Brain Tumors: Immunology, Biochemistry, Kinetics," February 1982.
95. Neurosurgical Society of America, Key West, Florida, "Carboxylated Amino Acids in Atheromatous Plaque: A Clue to Pathogenesis and Therapy," 8-11, 1983.



96. American Society of Biological Chemists, San Francisco, California, "Identification of Aminomalonic Acid in Nature," Invited, June 5-9, 1983.
97. Cook County Graduate School of Medicine, Review Course in Neurological Surgery, Invited Speaker, "Brain Tumors: Immunology, Biochemistry, Kinetics," February 1983.
98. Neurosurgical Society of America, San Diego, California, "A Surgical Microclip and Suction Applicator for Microsurgical Anastomosis," May 13-16, 1984.
99. Fourth International Symposium on Organic Free Radicals, St. Andrews, Scotland, "A Free Radical Model for the Development of Atherosclerosis," July 1984.
100. Western Neurosurgical Society, Colorado Springs, Colorado, "A New Microvascular Clip for Small Vessel Anastomosis," and "Aminomalonic Acid, Atherosclerosis and Aging," September 9-12, 1984.
101. Conducted research seminar at Columbia University, "Recent Studies on the Calcium Binding Properties of Aminomalonic Acid (Ama) Residues in Proteins," October 29, 1984.
102. American College of Surgeons, Chicago, Illinois, "Comparison of Suture and Clip for Microvascular Anastomosis," October 13-18, 1985.
103. American Academy of Neurological Surgery, Houston, Texas, "Comparison of Suture and Clip for Microvascular Anastomosis," October 27-30, 1985.
104. American Society for Reconstructive Microsurgery, New Orleans, Louisiana, "Comparison of Suture and Clip for Microvascular Anastomosis," February 14-15, 1986.
105. The Western Neurosurgical Society, Maui, Hawaii, "Microflange Approximation of the Microvasculature," September 28-October 1, 1986.
106. American Society of Neuroimaging, Tampa, Florida, "Measurement of Flow Rates in Small Diameter Vessels," February 28-March 3, 1987.
107. Federation of Western Societies of Neurological Science, San Diego, California, "Comparison of Suture and Clip for Microvascular Anastomosis," March 29-April 1, 1987.
108. American Association of Neurological Surgeons, Dallas, Texas, "Comparison of Suture and Clip for Microvascular Anastomoses," May 3-7, 1987.
109. Neurosurgical Society of America, Gleneden Beach, Oregon, "The Biology of Endothelial Repair with Microflanged Arterial Approximation," May 10-13, 1987.
110. American Academy of Neurological Surgery, San Antonio, Texas, "Vertebral Artery Aneurysms," October 7-8, 1987.
111. Department of Plastic and Reconstructive Surgery, University of California at Irvine, Irvine, California, "New Procedures for Venous Hypertension Based on the Microclip including Free Flap Transfers," January 8, 1990.
112. St. Thomas's Hospital Surgery Department, London, England, "New Concept and New Device for Vessel Anastomosis," January 24, 1990.
113. British Microsurgical Society Annual Meeting, Glasgow, Scotland, "New Concept for Microvascular Anastomosis," January 25 & 26, 1990.

114. Plastic Surgery Research Council, Washington, D.C., "A New Microclip for Microvascular Anastomosis: Report of Experimental and Clinical Research," April 18-21, 1990.
115. Tenth International Symposium on Microvascular Surgery for Cerebral Ischemia, San Francisco, California, July 14, 1990.
116. Focused Giving Science Symposium, Johnson & Johnson, New Brunswick, New Jersey, "Studies on Atherosclerosis," November 28, 1990.
117. New York University Medical Center, U.N. Scientific Delegation for People's Republic of China, Microvascular Surgical Demonstration, New York, New York, December 1, 1990.
118. University of California at Los Angeles, Microvascular Surgical Demonstration, Los Angeles, California, December 6, 1990.
119. Anfui Provincial Hospital, "New Approach for Bypass Surgery," People's Republic of China, March 25, 1991.
120. Beijing Ji Shi Tan Hospital, Beijing Institute of Traumatology & Orthopaedics, "New Method for Blood Vessel Reconstruction," People's Republic of China, April 3, 1991.
121. Cedars-Sinai Medical Center, "Venous Reconstruction with a Novel Penetration Clip," Los Angeles, California, April 12, 1991.
122. Kaiser Permanente Medical Center, "Head and Spine Trauma," Fontana, California, April 26, 1991.
123. Research Society of Neurological Surgeons, Duke University Medical Center, "Venous Reconstruction with a Novel Non-Penetrating Clip: Endoscopic Extension of the Technology to Other Approximations," Durham, North Carolina, May 4, 1991.
124. Cedars-Sinai Medical Center, Microvascular Surgical Demonstration, Los Angeles, California, May 9, 1991.
125. Seventh International Symposium of Radiopharmacology, "<sup>131</sup>I Anti-AMA Monoclonal Antibody for Radioimaging of Atheromas," Boston, Massachusetts, June 3-6, 1991.
126. University of Colorado Chemistry & Biochemistry Department, "Chemical and Biological Properties of Aminomalonic Acid (Ama) and Protein Bound Ama," Boulder, Colorado, September 15, 1991.
127. Loma Linda University Medical Center Biochemistry Department, "Percarboxylations and Postranslational Protein Modifications," Loma Linda, California, November 25, 1991.
128. Cabot Medical Corporation, Microvascular Surgical Demonstration, Langhorne, Pennsylvania, December 3, 1991.
129. United States Surgical Corporation, Microvascular Surgical Demonstration, Norwalk, Connecticut, December 4, 1991.
130. Davis & Geck, Microvascular Surgical Demonstration, Danbury, Connecticut, December 5-6, 1991.
131. University of Colorado Chemistry & Biochemistry Department, "Chemical and Biological Properties of Aminomalonic Acid (Ama) and Protein Bound Ama," Boulder, Colorado, February 15, 1992.

132. Microsurgical Replantation Transplantation Department, Microvascular Surgical Demonstration, San Francisco, California, April 15, 1992.
133. Shanghai 2nd Medical University, Ranji Hospital, "New Surgical Trade: Minimal Invasive Surgery," Shanghai, Peoples' Republic of China, May 11, 1992.
134. University of Louisville Surgery and Ob/Gyn Departments, Urology Division, "A New Method for Microvascular Anastomosis," Louisville, Kentucky, May 19, 1992.
135. NORINCO(G) Corporation, "New Surgical Trade: Minimal Invasive Surgery," Shanghai, Peoples' Republic of China, May 22, 1992.
136. Shanghai 2nd Medical University, Chinese Academy of Science, "New Surgical Trade: Minimal Invasive Therapy," Shanghai, Peoples' Republic of China, May 27, 1992.
137. United States Surgical Corporation, Microvascular Surgical Demonstration, Norwalk, Connecticut, June 18, 1992.
138. EBI Special Spine Surgeon Forum, Consultant, New York, New York, June 19, 1992.
139. Visiting Professor, University of Thessalonika School of Medicine, Thessalonika, Greece, August 1992.
140. First Congress of the International Society for Experimental Microsurgery, "New Microsurgical Stapler," Rome, Italy, August 24, 1992, Invited speaker.
141. 6th International Conference, The Korean Vascular Surgery Society, "Non-Penetrating Clip," Seoul, Korea, October 1-3, 1992, Invited speaker.
142. Invited Speaker, Canniesburn Hospital, "The Non-Penetrating Clip, Glasgow, Scotland, June 14, 1993.
143. Invited Speaker, The Institute of Experimental Clinical Research, "The Non-Penetrating Clip," Aarhus, Denmark, June 21, 1993.
144. Invited Speaker, **Kirsch WM**, Zhu YH. Harvard Medical School, "Vascular Reconstruction with Non-Penetrating Arcuate-Legged Clips: A Comparative Study," Progress in Angioscopy: Endovascular Grafting & Interventional Techniques, 1995.
145. Two Presentations at the 22nd World Congress of the International Society for Cardiovascular Surgery, Sept. 10-15, 1995.
146. Poster Presentation, American College of Surgeons, "Collagen Binding by Pressure: A New Paradigm in Wound Healing," October 1995.
147. Invited Speaker, Saitama Medical University, Yamaguchi University, Kyushu University, "Clinical Applications of the VCS Clip," Feb.7-13, 1996.
148. Invited Speaker, Stanford University Medical School, Endovascular International Techniques "Hands On" Workshop. April 11-12, 1996.
149. Presentation at 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, A Multi-Centered Controlled Clinical Trial Comparing Clips to Suture for Construction of Hemodialysis Vascular Access Sites, September 15-18, 1996.

150. Presentation at 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, Comparative Evaluation of Suture and Non-Penetrating Titanium Clips for Vascular Reconstruction, September 15-18, 1996.
151. Presentation at 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, Arterial Collagen Bonding by Pressure: A New Paradigm in Wound Healing, September 15-18, 1996
152. Presentation at 45th International Congress of the European Society for Cardiovascular Surgery, Venice, Italy, Complex Vascular Reconstructions Facilitated by Non-Penetrating Arcuate-Legged Clips, September 15-18, 1996.
153. Invited Speaker, American College of Surgeons, San Francisco, CA, Moderated live from Loma Linda University Medical Center via closed-captioned satellite of surgical procedure on "AV Fistula using VCS\* Vascular Clip System," October 8, 1996.
154. Invited Speaker, University of California, Los Angeles, Los Angeles, CA, "Vascular Clips vs. Suturing Vascular Anastomosis for Carotid Endarterectomy," November 4, 1996.
155. Invited Speaker, Harvard Medical School, "Vascular Reconstruction with Non-Penetrating Arcuate-legged Clips Reduces Intimal Hyperplasia: Endovascular Surgery and Interventional Techniques," 1996.
156. Invited Speaker, Albert Einstein College of Medicine, New York, "Experimental Basis For Clip Vascular Anastomoses: Why They Might Be Superior To Suture Anastomoses: Current Critical Problems, New Horizons and Techniques in Vascular and Endovascular Surgery," November 21-24, 1996.
157. Invited Speaker, University of Pennsylvania School of Medicine, Philadelphia, PA, Vascular Conference, "Vascular Reconstructions with the VCS Clip," March 17, 1997.
158. Invited Speaker, University of California, Irvine, "Collagen Healing by Compression: A New Paradigm in Wound Healing," April 30, 1997.
159. Invited Speaker, Allegheny General Hospital, Pittsburgh, PA, Vascular Surgical Conference, "Use of Non-Penetrating Clips in Neurosurgical Procedures," May 19, 1997.
160. Invited Speaker, University of Pittsburgh, Pittsburgh, PA, Transplantation Conference. (Dr. Thomas Starzl), "Use of Non-Penetrating Clips for Transplantation Surgery," May 19, 1997.
161. Invited Speaker, University of Pittsburgh, Pittsburgh, PA, Vascular Surgical Conference. "The Use of Non-Penetrating Clips for Vascular Reconstructions," May 19, 1997.
162. Invited Speaker, World Congress of Minimal Invasive Surgery, Paris, France, "Facilitated End-to-Side Vascular Anastomosis with the VCS Clip Applier," May 29, 1997.
163. Meeting of the American Academy of Neurological Surgery and the Canadian Neurosurgical Society, 59th Annual Meeting, Banff, Alberta, Canada, "Vascular Reconstructions are Facilitated by Non-Penetrating Arcuate-Legged Clips," September 10-13, 1997.
164. Invited Speaker, Montefiore Medical Center, 24th Annual Symposium on Critical Problems, New Horizons and Techniques in Vascular and Endovascular Surgery, New York City. "Facilitated Vascular Anastomoses: The Non-Penetrating Arcuate-Legged Clip," November 20-23, 1997.
165. Harvard Medical School, Department of Continuing Medical Education, Progress in Angioscopy, Endovascular Surgery & Interventional Techniques 1997, Boston, MA. Advances in the Management and

- Imaging of Occlusive Vascular Disease. "New Cerebrovascular Surgery Applications of the Non-Penetrating Arcuate-Legged Clips," December 8, 1997.
166. Invited Speaker, Northwestern University Medical Center, Vascular Meeting, December 1997.
  167. Invited Speaker, University of Washington, Department of Vascular Surgery, Seattle, WA. "Vessel Anastomoses and the VCS® Clip." January 29, 1998.
  168. Invited Speaker, Allegheny General Hospital, Joint Latin American/North American Cerebrovascular Skull Base Workshop, "Vascular Reconstruction and Bypass," March 17, 1998.
  169. Invited Speaker, The United States Surgical Corporation, Train the Trainers, Miami, FL, April 1 & 2, 1998.
  170. Invited Speaker, Vascular Trauma Course, David Grant Medical Center, Uniformed Services University of the Health Sciences, "Vascular Closure Staples (VCS®Clips)," April 15, 1998.
  171. Invited Speaker, 1998 American Association of Neurological Surgeons Annual Meeting,, Philadelphia, PA. Poster – "Facilitated Vascular Anastomosis (The 'Single Shot' System)," April 25-30, 1998.
  172. Daniel B. Kim, Toomas Anton, Ghada Afifi, Wolff Kirsch, Robert A. Hardesty. "Frontal Cranial Bone Advancement: What Happens to the Dead Space?" Presented at the Plastic Surgery Research Council Meeting April 1998 and Presented at the California Society of Plastic Surgery Meeting May 1998, Won best resident scientific presentation.
  173. Invited Speaker, Harvard Medical School, Department of Continuing Education, The VCS clip for vascular reconstruction, Boston, MA, July 13, 1998.
  174. Invited Speaker, 25<sup>th</sup> Annual Symposium on Current Critical Problems, New Horizons and Techniques in Vascular and Endovascular Surgery. "Facilitated Vascular Anastomoses: The Non-Penetrating Arcuate Legged Clip. And What's New in Vascular Clipping: The One-Shot Device and Effects of Clipping on Intimal Hyperplasia." Montefiore Medical Center, New York City, November 19-22, 1998.
  175. Invited Speaker, Harvard Medical School, Department of Continuing Education. Progress in Angioscopy 1998: Minimally Invasive and Endovascular Surgery. Non-penetrant VCS Clip: An Improved Alternative to the Sutured Anastomosis. Boston, MA, December 6, 7 and 8, 1998.
  176. Invited Speaker, Annual Scientific Meeting, American College of Surgeons, Southern California Chapter, "A New System for Cerebrovascular Reconstructions: Non-penetrating, Arcuate-Legged Clips," Santa Barbara, CA January 24, 1999.
  177. Invited Speaker, 52<sup>nd</sup> Annual Meeting of The Neurosurgical Society of America, "A Four-Year Experience with Non-Penetrating Arcuate-Legged Clips for Cerebrovascular Reconstructions," Scottsdale, AZ, March 28-31, 1999.
  178. Invited Speaker, Medical College of Virginia, Virginia Commonwealth University, "Long-term follow-up of cerebrovascular reconstruction with vascular closure clips," Richmond, VA, April 24, 1999.
  179. Invited Speaker, Third Congress of the International Society for Neurosurgical Technology and Instrument Invention, "The nonpenetrating arcuate-legged clip: A new paradigm for vascular reconstruction," Las Vegas, NV, April 30, 1999.
  180. Invited Speaker, Davies Medical Center, "Microvascular reconstruction using the VCS clip," San Francisco, CA, July 23, 1999.

181. Invited Speaker, UCLA Medical Center, Liver Surgery Department, "What's new in the use of vascular clips, what are their assets, liabilities and pitfalls," Los Angeles, CA, September 14, 1999.
182. Invited Speaker, Annual Clinical Assembly of Osteopathic Specialists (ACA), "Vascular anastomosis performed with a non-penetrating clip," Seattle, WA, October 2, 1999.
183. Invited Speaker, 26th Annual Symposium on Current Critical Problems, New Horizons and Techniques in Vascular and Endovascular Surgery. "What's new in the use of vascular clips, what are their assets, liabilities and pitfalls," Montefiore Medical Center, New York City, November 20, 1999.
184. 28th Annual Symposium on Vascular Surgery. Sutureless Anastomosis Workshop, Rancho Mirage, CA, March 16, 2000.
185. Invited Speaker, 53rd Annual Meeting of The Neurosurgical Society of America. "Laparoscopic assisted lumboperitoneal shunting: Description of a new surgical procedure and application to clinical problems," Durango CO, June 6, 2000.
186. Invited Speaker, 42<sup>nd</sup> Annual World Congress - ICA '2000 (International College of Angiology). "A new system for cerebrovascular reconstructions - Non-penetrating arcuate-legged clips," Coronado CA, June 30, 2000.
187. Invited Speaker, 5<sup>th</sup> Congress of the International Society for Experimental Microsurgery. "A five year study of "sutureless" cerebrovascular reconstructions: Assets and liabilities," Catania, Italy, September 4, 2000.
188. Invited Speaker, 5<sup>th</sup> Congress of the International Society for Experimental Microsurgery. "Microvascular free tissue transfer in the presence of coagulation and vessel disorders: Recognition and Solutions," Catania, Italy, September 6, 2000.
189. Invited Speaker, Harvard University. "VCS clip applier workshop and tutorial," Natick MA, September 22, 2000.
190. Invited Speaker, 2000 Annual Clinical Assembly of Osteopathic Specialists. "The use of non-penetrating clips for dural reconstruction." Boston MA, September 22, 2000.
191. Invited Speaker, 2000 Annual Clinical Assembly of Osteopathic Specialists. "The use of non-penetrating clips in vascular surgery," Boston MA, September 22, 2000.
192. Invited Speaker, 27th Global Symposium Vascular and Endovascular Issues, Techniques and Horizons. "Update on Vascular Clips: Can They Be Used Endoluminally and for Venous Repairs?" New York NY, November 19, 2000.
193. Kirsch WM, Hendricks DL, Eichenberg B, Zhu YH, Anton L; Microvascular free tissue transfer in the presence of coagulation and vessel disorders: Recognition and solutions; Annual Meeting Am Soc for Reconstructive Microsurgery; 1/13-16/01; San Diego, CA.
194. Kirsh WM, Zhu YH, Anton L, Jessop N, Boyne P, Schubert C, Rajhansa D, Sapiente JR, Pedros R, Dickson C, Rotan E, Shafipour P. The new "Micro Surgiclip®" - A comparative study. 53rd Annual Meeting Neurosurg Soc Am., Amelia Island, FL, June 6-10, 2001.
195. **Kirsch WM**, Zhu YH, Steckel R, Concepcion W, Obert K, Anton L, Peckham N. In vivo remodeling of surgically constructed vascular anastomoses: Non-penetrating, arcuate-legged clips versus standard suture. BECON 2001 Reparative Medicine: Growing Tissues and Organs, NIH, Bethesda, MD, June 25-26, 2001.

**GRANTS & CONTRACTS AWARDED:**

<i>YEAR</i>	<i>AWARD</i>	<i>TITLE - AGENCY</i>	<i>AMOUNT</i>
1966-1976	Grant	General Research Assistance (ACS)	\$ 14,017
1966-1971	Grant	Histochemistry of Brain Tumors (NCI)	\$ 146,781
1970-1974	Grant	Neurosurgery Training (NINDS)	\$ 142,236
1972-1974	Contract	Virus Center Search (NCI)	\$ 50,598
1976-1978	Grant	Pediatric Brain Tumor Study (NCI)	\$ 46,507
1975-1977	Grant	Virus Cancer Research (NCI)	\$ 4,427
1976-1979	Grant	Cell Synchronization in Solid Tumors (NCI)	\$ 108,441
1976-1979	Grant	Pain Control in Cancer Patients (NCI)	\$ 71,999
1977-1980	Grant	Immunocytochemistry of Human Brain Tumors (VAH)	\$ 118,061
1979-1982	Grant	Fibrinolysis and Perineoplastic Brain Tumor Edema (VAH)	\$ 124,500
1983-1984	Grant	Distribution of -carboxyaspartic acid (Asa) and aminomalonic acid (-carboxyglycine, or Ama) in proteins (UNM Research Allocations Committee)	\$ 10,000
1983-1984	Grant	Cost-Effectiveness of Neurosurgical Care in the Native American Indian Population (UNM Foundation)	\$ 10,000
1983-1986	Grant	Carboxylated Amino Acids in Experimental Atherosclerosis (VAH)	\$ 140,000
1984-1986	Grant	Anatomic and Physiologic Studies of Rat Arteries and Veins Anastomosed with a Novel Microclip (UNM Foundation)	\$ 5,000
1984-	Grant	Proposal for Gene Study I (Biochemistry of Brain Tumors)(UNM Research Allocations Committee)	\$ 10,000
1985-	Grant	Shiley Valve Calcification Study (Shiley)	\$ 5,126
1985-	Grant	A New Amino Acid and Atherosclerosis (Fraternal Order of Eagles)	\$ 5,000
1985	Donation	Research Funding (Public Service Company of New Mexico)	\$ 2,500
1986-	Grant	Study of Cranial Shunt Infections and Malfunctions (Codman, Inc.)	\$ 5,750
1986-1988	Grant	Biologic Mechanism for Bioprosthetic Implant Calcification (VAH)	\$ 96,908
1986-	Grant	Microvascular Clip Development (Ethicon, Inc.)	\$ 250,000
1987-	Grant	A New Amino Acid and Atherosclerosis (Johnson & Johnson)	\$ 218,520
1988-	Grant	Mechanical Properties of Coronary Artery Anastomoses: Suture vs. Microclip (Davis & Geck)	\$ 13,333
1990-	Grant	Characterization of a Percarboxylated Epitope in Foam Cells (VAH)	\$ 26,801
1990-	Grant	Identification of Peptides Hydrolyzed from Ama-containing protein found on	\$ 5,100

		the surface of foam cells (Loma Linda University School of Medicine)	
1991-	Grant	Peripheral Nerve Repair (New Medico Head Injury Systems) (Dr. Kirsch)	\$ 5,000
1991-	Grant	Minimal Invasive Surgical Laboratory (LLUMC)	\$ 65,000
1991-	Grant	Minimal Invasive Surgical Laboratory (USSC)	\$ 100,000
1993	Donation	Microvascular Clip (W.L. Gore & Associates, Inc.)	\$ 1,000
1993	Donation	Cabot Medical Corporation	\$ 85,000
1993-1994	Consulting	United States Surgical Corporation	\$ 100,000
	Grant	(Donated to Minimal Invasive Lab)	
1994	Contract	United States Surgical Corporation (Vascular Access Study with clips)	\$ 45,000
1994	Grant	Bio-Vascular, Inc.	\$ 30,000
1996	Grant	United States Surgical (Dural Repair)	\$ 91,400
1997	Grant	United States Surgical Corporation (Biochemical, Biophysical, Morphological Properties of Stretched Ligaments)	\$ 42,000
1998	Grant	United States Surgical Corporation (Femoral Artery Hole Closure Device)	\$ 35,000
1998	Grant	United States Surgical Corporation - Tyco	\$ 1,500,000
2002	Grant	NIH grant award (Iron Metabolism Alterations In Alzheimer's disease)	\$ 6,550,000
		<b>GRAND TOTAL</b>	<b>\$10,937,376</b>